

U.S.S.N. 10/065,246

2

81045777

**In the claims:**

1. (Currently Amended) A control system for an automotive vehicle having a steering actuator comprising:

a lateral dynamic sensor generating a lateral dynamic signal corresponding to a condition of the vehicle;

a steering wheel angle sensor generating a steering wheel angle signal; and

a controller coupled to the steering actuator, the lateral dynamic sensor and the steering wheel angle sensor, said controller having

a first transfer function block determining a desired lateral dynamic condition in response to the steering wheel angle signal,

a second transfer function block determining a modified steering wheel input as a function of the desired lateral dynamic condition on the basis of a base vehicle model,

a correction control block determining a corrected steering wheel input as a function of the desired lateral dynamic condition and the actual lateral dynamic condition, and

a steering wheel input calculation block calculating a steering wheel input in response to the corrected steering wheel input and the modified steering wheel input, the corrected steering wheel input and the modified steering wheel input in a parallel input relationship with each other, wherein the controller controls the steering actuator on the basis of the calculated steering wheel input.

2. (Original) A system as recited in claim 1 wherein said steering actuator comprises a front right wheel actuator and a front left wheel actuator.

3. (Original) A system as recited in claim 2 wherein said front right wheel steering actuator and said front left steering actuator are independently controllable.

U.S.S.N. 10/065,246

3

81045777

4. (Previously Presented) A system as recited in claim 3 wherein said controller generates a front right control signal and a front left control signal in response to the corrected steering wheel input and the modified steering wheel input.

5. (Previously Presented) A system as recited in claim 1 wherein the lateral dynamic sensor comprises a lateral acceleration sensor generating a lateral acceleration signal, said system further comprising a speed sensor generating a vehicle speed signal, said controller determining the corrected steering wheel input as a function of the lateral acceleration signal and the vehicle speed signal.

6. (Original) A system as recited in claim 1 wherein said steering actuator comprises a rear steering actuator and a front steering actuator.

7. (Previously Presented) A system as recited in claim 1 wherein said controller determines a rear steering control signal in response to the corrected steering wheel input and the modified steering wheel input.

8. (Currently Amended) A method of controlling a vehicle having a steering actuator comprising:

measuring a steering wheel angle from a steering wheel angle sensor;

measuring an actual yaw rate;

determining a desired yaw rate in response to the steering wheel angle;

determining a modified steering wheel input in response to the desired yaw rate;

determining a corrected steering wheel input as a function of the desired yaw rate and the actual yaw rate;

calculating a steering wheel input in response to the corrected steering wheel input and the modified steering wheel input; and

controlling the steering actuator in response to the sum of the corrected steering wheel input and the modified steering wheel input.

U.S.S.N. 10/065,246

4

81045777

9. (Previously Presented) A method as recited in claim 8 further comprising generating a lateral acceleration signal from the condition sensor, generating a vehicle speed signal from a speed sensor, wherein determining a corrected steering wheel input comprises determining a corrected steering input as a function of the desired yaw rate, the actual yaw rate, the lateral acceleration signal, and the vehicle speed signal.

10. (Previously Presented) A method as recited in claim 8 wherein controlling the steering actuator comprises controlling a front steering actuator in response to the corrected steering wheel input, and the modified steering wheel input.

11. (Previously Presented) A method as recited in claim 8 wherein controlling the steering actuator comprises controlling a rear steering actuator in response to the corrected steering wheel input, and the modified steering wheel input.

12. (Previously Presented) A method as recited in claim 8 wherein controlling the steering actuator comprises controlling a front right steering actuator in response to the corrected steering wheel input, and the modified steering wheel input.

13. (Previously Presented) A method as recited in claim 8 wherein controlling the steering actuator comprises controlling a front left steering actuator in response to the corrected steering wheel input, and the modified steering wheel input.

14. (Previously Presented) A method of controlling a vehicle having a steering actuator comprising:

- measuring a steering wheel angle from a steering wheel angle sensor;
- determining a desired yaw rate in response to the steering wheel angle;
- feeding forward the desired yaw rate to form a feed forward desired yaw rate;
- determining a modified steering wheel input in response to the desired yaw rate;
- measuring a vehicle yaw rate from a yaw rate sensor;

U.S.S.N. 10/065,246

5

81045777

determining a yaw rate error as a function of the feed forward desired yaw rate and the vehicle yaw rate;

determining a corrected steering wheel input in response to the yaw rate error;

determining a steering actuator input as a function of the corrected steering wheel input and the modified steering wheel input; and

controlling the steering actuator in response to the steering actuator input.

15. (Previously Presented) A method as recited in claim 14 further comprising generating a lateral acceleration signal from a lateral acceleration sensor, generating a vehicle speed signal from a speed sensor, wherein determining a corrected steering wheel input comprises determining a corrected steering input as a function of the desired yaw rate and the vehicle yaw rate, the lateral acceleration signal and the vehicle speed signal.

16. (Previously Presented) A method as recited in claim 14 wherein controlling the steering actuator comprises controlling a front steering actuator in response to the corrected steering wheel input and the modified steering wheel input.

17. (Previously Presented) A method as recited in claim 14 wherein controlling the steering actuator comprises controlling a rear steering actuator in response to the corrected steer angle input and the modified steering wheel input.

18. (Previously Presented) A method as recited in claim 14 wherein controlling the steering actuator comprises controlling a front right steering actuator in response to the corrected steering wheel input and the modified steering wheel input.

19. (Previously Presented) A method as recited in claim 14 wherein controlling the steering actuator comprises controlling a front left steering actuator in response to the corrected steering wheel input and the modified steering wheel input.

U.S.S.N. 10/065,246

6

81045777

20. (Previously Presented) A method as recited in claim 14 wherein controlling the steering actuator comprises controlling a rear left steering actuator in response to the corrected steering wheel input and the modified steering wheel input.

21. (Previously Presented) A method as recited in claim 14 wherein controlling the steering actuator comprises controlling a rear right steering actuator in response to the corrected steering wheel input and the modified steering wheel input.

22. (Previously Presented) An automotive vehicle having a steering road wheel actuator comprises:

a yaw rate sensor generating a yaw rate signal corresponding to the actual yaw rate of the vehicle;

a steering wheel angle sensor generating a steering wheel angle signal;

a feedback controller and a feed forward controller coupled to the steering road wheel actuator using inputs from the yaw rate sensor and the steering wheel angle sensor, the feed forward controller calculates a desired yaw rate in response to the steering wheel angle, the feedback controller compares the actual yaw rate and a desired yaw rate to form a yaw rate error, determines a corrected steering wheel input as a function of the yaw rate error, the feedback controller controls the road wheel steering actuator in response to the corrected steering wheel input, and the modified steering wheel input determined as a function of the desired yaw rate to provide a steering angle that will result in a desired vehicle dynamic response.

23. (Cancelled)

24. (Currently Amended) A control system as recited in claim 1 wherein the lateral dynamic condition comprises yaw rate[.].